

Response to Peer Review Comments

On the Proposed Basin Plan Amendment to Determine Certain Beneficial Uses are not Applicable and Establish Water Quality Objectives for Mercury in Sulphur Creek

From Professor David L. Sedlak, Department of Civil and Environmental Engineering, University of California, Berkeley

Professor Sedlak's comments, dated 25 May 2006, are in plain text and Regional Water Board staff comments are in **bold type**.

General comments: The review establishes the absence of domestic water supply uses and sport fishing on Sulphur Creek. The document adequately supports the assertion that these beneficial uses were absent because prior to mining and would be unlikely to return if the mines and mine tailings were removed from the system. If the high concentrations of salt in the river is related to natural sources, the only way to make the water suitable for drinking would be to employ reverse osmosis, which would be extremely expensive in this situation. As a result, the staff report recommends target values for Hg associated with particles of 9 mg/kg, which is based on the 2006 proposed TMDL (which I have not been asked to review) for high flow conditions and 850 ng/L total Hg target for low flow conditions. Overall, I believe that this approach is consistent with the objectives of the Basin Plan and is justified by the supporting data.

1. My main concern pertains to the 30-day average low-flow target of 850 ng/L. This value was based on a total of eight grab samples collected over a period of four years. The concentrations in these samples ranged from 300 to 1200 ng/L. Additional data on mercury concentrations in the natural geothermal springs indicate an average concentration of 940 ng/L and a maximum value of 1300 ng/L (p. 23 of the 2006 Sulphur Creek TMDL). I am unfamiliar with the monitoring regime that is being considered in this system, but it seems likely that future sampling will be limited to grab samples. Given the variation in concentrations in the natural geothermal springs it appears that a value of 850 ng/L may be too stringent for any 30-day period. In my opinion, the practical aspects of achieving the low-flow target under natural background conditions should be considered more carefully in the document.

Staff recognizes that the data set on which the calculation of mercury water quality objectives is based is limited. Considering this, staff agrees with the peer reviewer's assertion that water quality objectives based on average concentrations may not be attainable. As such, staff modified the proposed objectives so that they are based on maximum measured concentrations rather than averages. See the public review draft staff report for details regarding calculation of the water quality objectives.

2. Somewhere in the executive summary or the body of the document it would be helpful to list the remaining beneficial uses after these changes are implemented.

The proposed Basin Plan amendment would determine that certain beneficial uses, some of which were assigned to Sulphur Creek through application of the tributary rule, do not apply in Sulphur Creek. No other beneficial uses were evaluated, so it is beyond the scope of this action to specifically designate beneficial uses for Sulphur Creek.

3. Page 4, second full paragraph: I suspect that the authors meant “High sulfide concentrations...” and not “High sulfate concentrations...”

The suggested change was made in the staff report.

4. Errors in Table 1: The different chemical species in the heading of Table 1 appear to be incorrect (e.g., HCO_3^- and not HCO_3).

The suggested change was made in the staff report.

5. Throughout the report the data are expressed with an unreasonable and inconsistent number of significant figures. For example, as many as four significant figures are used in Table 1. None of these anions or cations can be measured with this high degree of precision. Likewise, the conductivity values and mercury concentrations cited on pages 6 and 7 as well as the tables in the appendices represent an unrealistic level of precision. The inconsistent use of significant figures implies a level of confidence in the data that is unreasonable and should be corrected.

The data came directly out of the TMDL staff report, which compiled data from other published reports. Water quality objective calculations were based on the correct number of significant figures. Staff did not deem it appropriate to correct previously published work so the report was not changed.